APPLICATION OF

TENASKA VIRGINIA II PARTNERS, L.P. **CASE NO. PUE-2001-00429**

For approval of a certificate of public convenience and necessity pursuant to Va. Code Section 56-265.2, an exemption from Chapter 10 of Title 56, and interim approval to make financial commitments and undertake preliminary construction work

REPORT OF HOWARD P. ANDERSON, JR., HEARING EXAMINER

September 10, 2002

On August 15, 2001,Tenaska Virginia II Partners, L.P. ("Tenaska II" or the "Applicant"), filed an application for a certificate of public convenience and necessity ("CPCN") pursuant to § 56-265.2 of Chapter 10.1 of Title 56 of the Code of Virginia to construct and operate a 900 MW natural gas-fired, combined cycle generating facility (the "Bear Garden facility" or "proposed facility") in Buckingham County, Virginia. The Applicant seeks an exemption from the provisions of Chapter 10 of Title 56, pursuant to § 56-265.2 B of the Code of Virginia, and interim approval to make financial expenditures and undertake preliminary construction work, pursuant to § 56-234.3 of the Code of Virginia.

On September 13, 2001, the Commission entered an order requiring the Applicant to provide public notice of its application, establishing a procedural schedule for the filing of testimony and exhibits, and scheduling an evidentiary hearing for December 10, 2001.

On December 10, 2001, the evidentiary hearing was convened as scheduled. Richard D. Gary, Esquire, Jay Holloway, Esquire, and Angie Jenkins, Esquire, appeared on behalf of the Applicant. M. Renae Carter, Esquire, appeared on behalf of Columbia Gas of Virginia, Inc. ("Columbia"). Katharine A. Hart, Esquire, and C. Meade Browder, Jr. Esquire, appeared as counsel to the Commission.

At the commencement of the hearing, Columbia Gas presented a Stipulation[1] agreed to by Staff and the parties. Proof of public notice was marked as Exhibit A and made a part of the record. Three public witnesses testified at the hearing. At the conclusion of the hearing, Staff and the Applicant were directed to file post-hearing briefs on the issue of water discharge.

On January 16, 2002, the Commission issued an Order in *Application of Tenaska Virginia Partners, LP*[2] (*"Tenaska"*) remanding the case for further proceedings. In *Tenaska*, the

[1]Ex. CG-1; Attached as Appendix A to this Report.

[2]*Application of Tenaska Virginia Partners, LP, For approval of a certificate of public convenience and necessity pursuant to Virginia Code § 56-265.2, an exemption from Chapter 10 of Title 56, and interim approval to make*

Commission pointed out that the Code of Virginia establishes six general criteria applicable to electric generating plant applications: (1) reliability, (2) competition, (3) rates, (4) environment, (5) economic development, and (6) public interest. A majority of the Commission held that the record in *Tenaska* was incomplete with respect to the consideration of the environment. Specifically, a majority of the Commission interpreted the applicable Virginia law as requiring the Commission to "consider the cumulative impacts of other proposed facilities, together with the [Applicant's] facility, on the existing air quality in the area that may be impacted by the Facility."[3]

By Hearing Examiner's Ruling of March 26, 2002, this proceeding was reopened to receive additional evidence regarding three issues: (1) the cumulative impact of existing and proposed electric generating facilities on air quality in Buckingham County and surrounding counties; (2) the environmental impact of the lateral natural gas pipeline that will connect the proposed facility with the interstate gas pipeline of Transcontinental Gas PipeLine Corporation ("Transco"); and (3) the effects on transmission reliability of interconnecting the proposed facility to Dominion Virginia Power's transmission grid. The Ruling further established a procedural schedule for the filing of additional testimony and exhibits relating to these issues and established a hearing date of May 28, 2002.

On April 25, 2002, Tenaska II filed its testimony and exhibits on the additional issues. On May 9, 2002, Staff filed its testimony and exhibits. At the hearing on May 28, 2002, Richard D. Gary, Esquire, Kevin Finto, Esquire, and Jay Holloway, Esquire, appeared on behalf of Tenaska II. Katharine A. Hart, Esquire, appeared as counsel to the Commission. Columbia reiterated in a letter to the Commission dated May 21, 2002, that it does not oppose certification of the proposed facility and did not appear at the hearing. No public witnesses appeared. On July 12, 2002, counsel for Tenaska II submitted a brief addressing the evidence presented at the hearing on May 28, 2002. Transcripts of the proceedings are filed with this Report.

SUMMARY OF THE RECORD

Public Witnesses

Three public witnesses testified at the December 10, 2001, hearing. All spoke in support of the proposed facility.

Roger Hill lives in the New Canton area of Buckingham County and is chairman of the Buckingham County Industrial Development Authority. Mr. Hill stated that the citizens of Buckingham County overwhelmingly support the Tenaska II project and the proposed site is well suited for a power facility. Mr. Hill pointed out that Buckingham County is basically rural and has had little industrial development in the past. The Tenaska II project will add more than $250 million to the County's tax base and help relieve the tax burden on the County's residents.[4]

---

financial commitments and undertake preliminary construction work, Case No. PUE-2001-00039, Order (January 16, 2002).

[3]Order at 26.

[4]Tr. 4, 5.

Brian Bates is a lifelong resident of Buckingham County and serves on the Board of Supervisors. Mr. Bates testified that the Applicant agreed without hesitation to the 34 special conditions contained in the County's special use permit. Mr. Bates also pointed out that Buckingham is a rural county and the Bear Garden facility would be an incredible asset to the community. According to Mr. Bates, the Tenaska II project would not impact the County's infrastructure and would produce very good paying jobs. Mr. Bates concluded that the proposed facility is a very good thing for Buckingham County.[5]

Rebecca Carter, county administrator for Buckingham County, reiterated that the citizens of Buckingham County overwhelmingly accept and welcome the proposed facility. Ms. Carter stated that the proposed site on the Buschmann and Westvaco properties is well suited for a power plant and that the land surrounding the proposed facility will be preserved in its natural state. Ms. Carter maintained that the new, more efficient pollution control technology used by the Applicant will help "the State to shut down some old, dirty generating plants in that vicinity."[6] Finally, Ms. Carter testified that the Buckingham County Planning Commission and Board of Supervisors unanimously approved the plans for the proposed facility.[7]

Testimony and Evidence

On December 10, 2001, Tenaska II presented the testimony of two witnesses: T. R. Ownby, project manager for Tenaska II; and Dr. Greg Kunkel, manager of environmental affairs for Tenaska, Inc.

In his prefiled testimony, Mr. Ownby described the proposed facility as a 900 MW natural gas-fired, combined cycle power plant located approximately one mile southeast of New Canton in Buckingham County. The proposed facility will be capable of operating as a year-round base load generating facility. Tenaska II has acquired a long-term lease on 670 acres (the "Buschmann property") and has a contract to purchase 440 adjacent acres (the "Westvaco property"). These two adjacent properties totaling 1,110 acres comprise the project site. The proposed facility will be located on 50 acres near the center of the Buschmann property.[8]

Mr. Ownby anticipates the Company will enter into a tolling agreement with a major wholesale power purchaser that will provide natural gas for the proposed facility and purchase the entire output of the plant. The power would then be sold in the wholesale market.[9]

The proposed facility will be interconnected to the Dominion Virginia Power 230 kV Bremo to Farmville transmission line at or near the Bremo Substation. The tolling party will provide natural gas through the Transco interstate pipeline that runs through Fluvanna and Buckingham Counties. It is anticipated that Transco will construct, own and operate a lateral pipeline from a point north of its compressor station in Fluvanna County, along Bremo Bluff to the Dooms 115 kV

[5]Tr. 7-9.
[6]Tr. 11.
[7]Tr. 12.
[8]Tenaska II has leased a substantial portion of the rest of the Buschmann property back to the Buschmanns, who live on the property and have indicated to Mr. Ownby that they will maintain the property in its natural state. (Ex. TRO-2, at 3).
[9]Id.

transmission line right-of-way, then to a meter station on the facility's site. Tenaska II will construct, own and operate plant piping between the meter station and the proposed facility.[10]

The proposed facility is estimated to increase the Buckingham County tax base by more than $250 million for the life of the project. During the two-year construction period, the proposed facility will employ between 500 and 600 construction workers.

The Company filed a Prevention of Significant Deterioration ("PSD") permit application and a wastewater discharge permit application with the Virginia Department of Environmental Quality ("DEQ"). East Coast Transport, Inc. ("ECTI"), a Virginia public service company and a Tenaska affiliate, submitted a Joint Permit Application to construct a water intake structure and pump station to provide raw water to the proposed facility in Buckingham County and the proposed Tenaska plant in Fluvanna County.[11]

Dr. Kunkel testified that the Bear Garden facility will be a 900 MW combined cycle facility consisting of three General Electric 7FA combustion turbines ("CTs"), three Heat Recovery Steam Generators ("HRSGs") with duct burners, and a single steam turbine. Although pipeline quality natural gas will be the primary fuel for the CTs, Tenaska II proposes to use 0.01% sulfur distillate fuel oil as a backup fuel for up to 720 hours per year. Auxiliary equipment includes an auxiliary boiler, an emergency diesel generator, a diesel fire pump, six "black start" diesel generators, two distillate oil storage tanks, and a cooling tower.

The six black start diesel generators will be used for cold starting the first turbine when electric power is not available from the grid. Each black start diesel generator will be driven by a diesel engine capable of producing 2,000 kilowatts of electricity. The Applicant plans to limit the distillate diesel fuel burned by the diesel generators to 102,000 gallons per year. To this end, the proposed facility will include up to two 50,000-barrel capacity fuel oil storage tanks. These welded steel tanks will be designed and tested in accordance with industry standards. Containment measures will also be implemented. Fuel oil deliveries will be made by truck.[12]

Emission controls for the Bear Garden facility include dry low-nitrogen oxide ("NO_x") combustors in each CT. A Selective Catalytic Reduction ("SCR") system will be installed to further reduce NO_x emissions from each combined CT/HRSG exhaust stack to less than 4.5 parts per million by volume dry ("ppmvd") at 15% oxygen while firing natural gas and less than 6.3 ppmvd at 15% oxygen while firing distillate fuel oil. In addition to the SCR system, water injection will be used to reduce NO_x formation from the CTs during distillate firing,. The use of clean fuels will minimize emissions of sulfur dioxide ("SO_2") and particulate matter ("PM"). Carbon monoxide ("CO") emissions will be limited by combustion controls.[13]

Dr. Kunkel testified that the results of the proposed facility's air analysis contained in its PSD permit application[14] demonstrate that, even assuming the proposed facility will emit at its

[10] Id. at 4.
[11] Id. at 5.
[12] Ex. GK-3 at attached Ex. GK-R-1, at p. 2, 3 of the Environmental Assessment.
[13] Ex. GK-3, at 2.
[14] Ex. GK-3 at Ex. GK-R-1 Tab 6.

maximum potential emissions rate,[15] air quality impacts will be well below all applicable federal and state health-based standards. It is clearly very conservative to assume, according to Dr. Kunkel, that the proposed facility will run continuously year round. Realistically, Dr. Kunkel projects the proposed facility will run 60% of the time. It is also unlikely that the plant will run for the entire 720 hours requested on distillate fuel oil.[16]

In order to develop a conservative and highly defensible model, Dr. Kunkel explained that the model reflects the worse-than-worst case scenario. For each of the modeled pollutants, the worse-than-worst case results are compared to what are called "significance" levels, which are established by the federal government. These significance levels are typically set at a small fraction of the National Ambient Air Quality Standards ("NAAQS") for each pollutant. For example, the significance level for NO_2 is one percent of the NAAQS for NO_2. By using worse-than-worst case modeling and showing that the proposed facility's emissions will not reach these significance levels, Dr. Kunkel concluded that the proposed facility will not adversely affect the environment.

Further, Dr. Kunkel stated that analyses contained in the PSD permit application demonstrate that, again using the worse-than-worst case projections, the proposed facility will not significantly impact any nearby national parks or wilderness areas.[17] Dr. Kunkel testified that the air impact modeling protocol was reviewed by DEQ and Federal Land Managers for the nearby national parks and wilderness areas.[18]

Dr. Kunkel further explained that, when considering the environmental effects of new electric generating facilities, it is appropriate to consider the federal Environmental Protection Agency's ("EPA") call for State Implementation Plans ("SIP Call") to reduce NO_x emissions. These new federal regulations will require emission reductions of over 20,000 tons of NO_x annually in Virginia and place a cap on emissions that is far below the present levels. Further NO_x emissions reductions are required under federal regulations issued pursuant to the Clean Air Act Section 126 Petition process.[19] Dr. Kunkel concluded that, in the developing competitive marketplace for electric services, new combined cycle facilities like the one proposed can cost-effectively achieve very low emissions, thereby providing a means for achievement of significant improvements in air quality within Virginia.[20]

The Bear Garden facility will require approximately seven million gallons of water per day ("MGD") to operate.[21] Tenaska II plans to obtain its water needs from ECTI, incorporated as a

---

[15]This model assumes emissions from continuous operation at maximum duty (i.e., worse-than-worst case) will occur 24 hours a day for 365 days a year. This is conservative because maximum duty only occurs at low temperature conditions.

[16]Ex. GK-3, at 4.

[17]Air quality analyses are required to ensure that the natural and cultural resources of certain designated national parks and wilderness areas (Class I areas) are not adversely impacted by air pollution. Federal Land Managers are required to protect Class I areas and have established air quality related values ("AQRVs") to assess the impacts of new and existing facilities on these areas. Theses ARQVs include visibility, regional haze, and the deposition of nitrates and sulfates on soil, surface waters, and vegetation.

[18]Ex. GK-3, at 5.

[19]64 Fed. Reg. 28, 250 (May 25, 1999).

[20]Ex. GK-3, at 6, 7.

[21]In his rebuttal testimony, Dr. Kunkel stated that ECTI will supply up to 7.5 MGD for the plant operations and an additional one MGD per day for storage. (Ex. GK-8, at 3).

Virginia public service corporation on January 16, 2001. ECTI was formed with the assistance of Tenaska to provide raw, non-potable water to the Tenaska facilities in Buckingham and Fluvanna Counties. ECTI proposes to construct water intake facilities on the James River immediately adjacent to the Bear Garden facility to obtain its water. In order to operate, ECTI must obtain approval from the DEQ, the Virginia Marine Resources Commission, and the U.S. Army Corps of Engineers.[22] A pipeline to be constructed by ECTI will lead to a pumping facility that will be constructed and owned by Tenaska II on the Bear Garden site. A reservoir located adjacent to the Buschmann property will be constructed and owned by Tenaska II for use during periods of drought. The Tenaska facility in Fluvanna County may contract with Tenaska II for use of the reservoir during drought periods as well.[23]

Dr. Kunkel further testified that wastewater effluent consisting primarily of cooling tower blowdown, low volume waste sources, and storm water will be discharged into the James River at an outfall located adjacent to the Bear Garden site. A Virginia Pollution Discharge Elimination System ("VPDES") permit application was filed with DEQ and is contained in the Environmental Assessment ("EA") filed with the application in this case. Dr. Kunkel stated that effluent discharge from the Bear Garden facility will meet relevant guidelines for New Source Performance Standards contained in 40 CFR Part 423. In conclusion, Dr. Kunkel reiterated that Tenaska II will establish an Environmental Management System that will ensure compliance with all applicable environmental laws and regulations.[24]

The Commission Staff presented the testimony of Lawrence T. Oliver, assistant director of the Division of Economics and Finance; Mark K. Carsley, principal research analyst in the Division of Economics and Finance; and Marc A. Tufaro, assistant utilities analyst in the Division of Energy Regulation. Staff testimony was stipulated into the record without cross-examination.

In his prefiled testimony, Staff witness Oliver stated that Tenaska II and its affiliated companies are part of a privately owned holding company headquartered in Omaha, Nebraska. This holding company structure was created in 2000 to consolidate Tenaska Virginia, Tenaska II, and its other affiliates into Tenaska Energy, Inc. and Tenaska Energy Holdings, L.L.C. ("The Tenaska Company"). In early 2001, The Tenaska Company was ranked third by Energy Insight Today for announced construction of MW capacity in North America. The parent company typically establishes a limited partnership to own the proposed generating asset. Another general partner, Tenaska Virginia, leads the development, acts as managing general partner and is typically the largest equity or sole owner. Tenaska II and its affiliated companies have approximately 7,200 MW of electric generation facilities in financing, construction, or operation and another 6,000 MW in advanced development internationally and in the United States.

The Applicant anticipates financing the proposed Bear Garden facility with a combination of equity and non-recourse financing[25] from large U.S. and international commercial banks and/or the U.S. corporate bond market. Mr. Oliver believes that the most important aspect of a proposed

[22] A copy of ECTI's Joint Permit Application is attached to Dr. Kunkel's direct testimony. (Ex. GK-3).
[23] Id. at 8.
[24] Id. at 9, 10.
[25] Non-recourse financing is financing on a project basis where the security or collateral for the loan is the actual project or, in this case, the power plant. In the event of default, lenders in this type of arrangement have no recourse against the assets of the partnership beyond the underlying project. (Ex. LTO-4, at 4).

power plant is its ability to produce a predictable stream of revenue or cash flow. In most cases this predictable revenue comes from a purchase power contract with a purchaser of high credit quality to ensure payment for the power.[26]

Tenaska II represents that it will not provide retail electric service to end users in Virginia; therefore, it is anticipated that the power produced will be sold on a wholesale basis. Tenaska II's wholesale sale of power will be subject to the jurisdiction of the Federal Energy Regulatory Commission. Tenaska II further represents that no utility whose rates are regulated by this Commission has any financial or ownership interest in the project.

Mr. Oliver believes that it is not critical for Tenaska II to enter into a purchase power contract for the sale of the power at this time. However, absent a contract, he believes it unlikely the project could be financed and built on terms that would make it profitable. Mr. Oliver believes the proposed Bear Garden facility is otherwise viable and recommends the issuance of a CPCN. However, Mr. Oliver also recommends the certificate contain a two-year sunset provision that if construction is not commenced within two years of the Commission's order granting the certificate, the certificate will expire.[27]

Mark Carsley provided testimony regarding the economic benefits to be derived from the construction and operation of the proposed Bear Garden facility. Tenaska II did not present an analysis of the economic benefits of the proposed facility using a standard economic methodology. Instead, with the exception of estimated tax revenues, Tenaska II based its evaluation of the economic impact of the proposed facility primarily on its experience in constructing and operating similar plants. Tenaska II estimates the Bear Garden facility will add $250 million to the tax base of Buckingham County. Based on the Company's previous experience, 500 to 600 workers will be employed during the two-year construction phase of the project. A large portion of these workers should come from Buckingham County and the surrounding region. Tenaska II estimates the payroll during the construction phase will have indirect benefits of $13.2 million annually.

Mr. Carsley testified that, when operational, the proposed facility will employ 25 to 30 permanent workers at an average annual salary of $55,000 per year. Based on these figures, the proposed facility will generate $1.4 to $1.6 million in direct economic benefits annually to Buckingham County and the surrounding region. According to Tenaska II, wages paid and payments to contractors combined will provide indirect benefits to the economy of Central Virginia of approximately $3 million annually. Further, Buckingham County should incur no costs relating to infrastructure improvements necessary to accommodate the construction and operation of the proposed facility. Tenaska II has received no financial or other concessions from Buckingham County or the Commonwealth of Virginia.[28]

While the economic benefits described by Tenaska II appear to be substantial, Mr. Carsley stated that it is important to note the Applicant has provided no analysis based on a standard economic methodology. According to Mr. Carsley, this precludes a proper assessment of economic benefits because without a standard methodology, the economic effects of increased tax revenues,

[26] Id.
[27] Id. at 6.
[28] Ex. MKC-5, at 2, 3.

wages, and spending on construction materials cannot be appropriately quantified. An appropriate analysis must include adequate modeling of the local economy and economic characteristics of the proposed facility. The analysis should also include justifications for assumptions of the proportions of wages spent in the local economy, a calculation of the multipliers for the effects of wages and tax revenues, as well as for purchases of goods and services specific to the relevant economy.

Mr. Carsley, in addressing the facility's impact on furthering economic competition by eliminating market power, pointed out that the proposed facility will provide 900 MW of generating capacity within the Dominion Virginia Power service area. The incumbent utility will not own this capacity. Although a tolling agreement is not in place at this time, thereby making the ultimate ownership of the power uncertain, it is generally assumed that adding capacity not controlled by the incumbent utility is desirable to further electric competition. To this end, Mr. Carsley recommends that Tenaska II be directed to report the name and corporate affiliation of any company entering into a tolling agreement for the proposed facility.[29]

Marc Tufaro provided testimony addressing the proposed facility's impact on rates and reliability of regulated service and technical viability. Mr. Tufaro explained that the proposed facility will not be in the rate base of any regulated utility. Moreover, Staff is not aware of any contract(s) to sell the electrical output of this facility to any Virginia jurisdictional electric distribution company.

Mr. Tufaro testified that the proposed facility will interconnect with the existing 230 kV Bremo to Farmville transmission line owned by Dominion Virginia Power. Dominion Virginia Power conducted a study of Tenaska II's connection of the proposed facility to its transmission system to determine the details of interconnection, equipment configuration, and the costs and schedule for completing the work. Dominion Virginia Power concluded that the proposed facility can be accommodated with system improvement. Costs resulting from the interconnection will be borne by Tenaska II. Mr. Tufaro stated that, because Tenaska II will be responsible for the upfront and ongoing costs associated with the interconnection, the addition of the Tenaska II facility will have negligible, if any, impact on Dominion Virginia Power's retail rates.[30]

On May 9, 2002, Staff witness Tufaro filed two pages of supplemental testimony. Staff reiterated its support of the application and Mr. Tufaro stated that, in his opinion, the Company has met the criteria set forth in §§ 56-265.2 and 56-580 D of the Code of Virginia.[31]

DEQ filed at Staff's request, a review by the various state and local agencies responsible for environmental permits associated with the Tenaska II facility. The information considered in this review was provided by Tenaska II in two documents, the application dated August 15, 2001, and an EA dated September 21, 2001. Based on this information DEQ has received comments from appropriate state agencies, the regional planning district commission, and the locality involved to formulate this review of potential impacts to natural resources associated with the proposed Bear Garden generating facility. At the hearing on December 10, 2001, Derral Jones of the Department

[29]Ex. GKC-5, at 5, 6.
[30]Ex. MAT-6, at 4.
[31]Ex. 16, at 2.

of Conservation and Recreation ("DCR") and David Paylor from DEQ testified regarding the environmental review.

Derral A. Jones, planning bureau chief in the Planning and Recreation Resources Division of DCR, explained that the proposed Bear Garden facility is in close proximity to the existing Bremo Bluff Power Station ("Bremo Power Station"). As a result of the Bremo Power Station's operational water discharge, the James River is already thermally impacted in this area. Mr. Jones testified that the concern of DCR is that the Tenaska II project would add to that impact by further raising the river's water temperature.[32] Mr. Jones suggested that, instead of discharging approximately a million gallons of heated water back into the river, Tenaska II route the wastewater to a retention structure. This would allow for further cooling before discharge into the James River and/or the water could be recycled for the facility's use thereby reducing the amount of water withdrawn from the river.[33]

David Paylor is the director of program coordination at the DEQ, and is in charge of the air, water, and waste divisions in the central office and coordinating regional operations. He explained that Section 316(a) of the Federal Clean Water Act provides for variances to temperature water quality standards based upon a demonstration that there is no effect on the propagation and protection of aquatic species. Mr. Paylor further noted that there are a number of 316(a) determinations in Virginia; most are located below power facilities. A 316(a) determination is based on the collection of chemical, physical, and biological data to demonstrate that the discharge provides for the protection and propagation of a balanced indigenous population of shellfish, fish, and wildlife.[34]

Mr. Paylor testified that, as evidenced through the 316(a) studies as well as the performance of power plants, fluctuations in temperature from plant discharges cause biological problems when discharges are terminated in the wintertime due to a plant shutdown. The rapid drop in the water temperature can sometimes result in a fish kill. The 316(a) variance for the Bremo Power Station allows for water temperatures that are higher than the standard in an area limited to no more than 40% of the width of the river and five and one-half miles downstream.[35] This area of the river where the heated water from the Bremo Power Station is discharged is referred to as a "mixing zone."

Because the Bear Garden facility would discharge heated water into the James River from the opposite side of the river from the Bremo Power Station, DEQ must take the current conditions into consideration in issuing a VPDES permit. When questioned about the recommendation that the discharge be sent back to the reservoir, Mr. Paylor stated that, while DEQ supports the general principal of recycling, more review will be necessary before it would recommend recycling the discharge.[36]

[32]Tr. 45.
[33]Tr. 46, 48.
[34]Tr. 59.
[35]Tr. 60.
[36]Tr. 65, 68.

As described in the Company's EA, operation of the proposed facility will require approximately seven MGD of water[37] that is to be drawn from the James River by ECTI. Raw water will be pumped to a storage tank with a capacity of 3.5 million gallons prior to "clarification." Afterwards, the water would be pumped to a tank of the same capacity. An additional storage tank with a capacity of 500,000 gallons would store clarified and filtered water. Potable water will be obtained from a groundwater well on the project site, or from a rural potable water supplier. ECTI and Tenaska II also propose to construct an emergency water supply reservoir covering approximately 56 acres in what is now a pine plantation adjacent to the project site.[38]

Numerous regulatory permits will be required for the proposed facility including the following:

1. *Water Resources Permits*:

   a. A Virginia Pollutant Discharge Elimination System Stormwater General Permit for construction activities. This permit is required when five or more acres of land would be disturbed;
   b. A Virginia Water Protection ("VWP") permit for the water supply intake as well as for impact on any jurisdictional wetlands affected by the project and associated facilities;
   c. A VPDES permit for the wastewater discharge.

2. Subaqueous Bed Encroachment Permit

A permit to encroach in, on, or over state-owned subaqueous riverbeds.

3. Air Quality Permits

In addition to a PSD permit, the proposed project also requires an Acid Rain permit under Title IV of the federal Clean Air Act and a federal Operating Permit under Title V of the Clean Air Act. Included among the requirements for these permits will be appropriate elements of the New Source Performance Standards ("NSPS").

4. *Historic and Archaeological Resources Coordination*.

The EA indicates that the proposed Bear Garden plant and associated facilities will not, with one exception, affect historic properties. The proposed reservoir would inundate two historic structures.

Tenaska II will have to coordinate directly with the Department of Historic Resources.

[37]Dr. Kunkel testified in rebuttal that ECTI will supply up to 7.5 MGD for facility operations and an additional 1 MGD for storage. (Ex. GK-8, at 3).
[38]Ex. GK-3, EA at 4, 5 and 11.

5. *Erosion and Sediment Control Plan; Stormwater Management Plan*

Tenaska II must submit an Erosion and Sediment Control Plan to Buckingham County. For pipeline construction, Tenaska II must comply with its general Erosion and Sediment Control Specifications approved by the DCR pursuant to § 10.1-563 D of the Code of Virginia.

6. Water and Sewer Line Approvals

Plans and specifications for small water wells (serving fewer than 25 employees or residents) and on-site wastewater systems must be approved by the Danville office of the Virginia Department of Health. Wells serving more than 25 people must be approved by the DEQ Office of Water Programs in Richmond.

7. Soil Contamination

DEQ's Office of Remedial Programs recommends that the DEQ South Central Regional Office be contacted to obtain information on any contaminated sites in the vicinity of the project area. That office should also be contacted if contaminated soils are discovered in construction or preparation activities.

8. Transportation and Property Access

Tenaska II will need to contact the Virginia Department of Transportation's Dillwyn office to acquire a land use permit to facilitate property access before construction begins. The Virginia Department of Transportation indicates that the construction of this project will not generate additional traffic or negatively affect the road network surrounding the project area.[39]

Based on the information and analysis submitted by reviewing agencies, DEQ made several recommendations. The Applicant should:

1. Comply with all of the conditions of permits and approvals listed in the "Regulatory and Coordination Needs" section of Comments and Recommendations.

2. Consider alternative methods for managing wastewater from the generating plant. The DCR requests that consideration be given to finding alternatives to discharging into the James River during high stress periods. During periods of low flow, the thermal impact from the Bremo Power Station and the Bear Garden plant will be greater because there is less water in the river to cool the heated discharge from the two power plants. DGIF recommends: (i) re-routing the thermal effluent from the James River to the proposed reservoir to provide increased cooling time before the effluent is returned to the river; and (2) coordinating with their agency to develop wildlife habitat areas, public fishing and boating, and enhanced waterfowl habitat.

[39]Ex. MAT-6, Appendix A, at 13, 14.

3. Implement measures for all in-stream work to protect fisheries as recommended by the Department of Game and Inland Fisheries ("DGIF"). These measures include:

- Impose a time-of-year restriction for in-stream work from May 15 through July 31, to protect spawning adult fish;

- Restrict in-stream activities to periods of low flow conditions;

- In conducting in-stream activities, Tenaska II or its contractor must:

    - Use non-erodible cofferdams to isolate the construction area;
    - Block no more than 50% of the streamflow at any given time;
    - Stockpile excavated material in a manner that prevents its re-entry into the stream;
    - Restore original contours of the streambank and streambed.

- Minimize tree removal along the pipeline corridor;

- Re-vegetate barren areas;

- Implement strict erosion and sediment control measures throughout the project period; and

- Place notices in the local newspaper and signs at the nearest boat launches to warn boaters of in-stream work.

4. Correlate flow conditions with flow requirements at the two downstream water withdrawal sites operated by the City of Richmond and Henrico County.

5. Analyze the cumulative impact of the Tenaska I and Tenaska II facilities, to determine specific water allocations for each facility.

DGIF supports the Applicant's proposal to construct an infiltration gallery beneath the riverbed to serve as the water intake for the proposed facility. DGIF explains that the infiltration gallery is likely to eliminate impacts on aquatic resources that would ordinarily be associated with a screen intake structure.[40]

6. Implement a long-term monitoring program for the Fluvanna Ruritan Lake, a popular 50-acre lake owned by DGIF and located within two miles of the proposed plant site. Previous water quality sampling indicates the lake is sensitive to acidification due to watershed geology. A long-term monitoring program would measure changes in pH and alkalinity at the lake.

7. To the extent practicable, continue to coordinate with DGIF to develop wildlife habitat areas and enhanced waterfowl habitat and recreational opportunities.

[40]Ex. MAT-6, Appendix A at 7.

- DEQ's Office of Remedial Programs ("Waste Division") indicated that, although hazardous materials such as tanks for distillate fuel and ammonia would be located at the plant site, waste issues were not addressed in Tenaska II's EA. DEQ recommends that hazardous materials should be handled in accordance with the Virginia Hazardous Waste Management Regulations (9 VAC 20-60 et seq.). In addition, the spill prevention, control, and countermeasure provisions in 40 C.F.R. § 112 should be followed. After a cursory review of its data files, the Waste Division found no contamination sites in the vicinity of the proposed project site. Finally, the Waste Division recommends that all solid wastes associated with the construction and operation of the proposed facility should be reduced at the source, re-used, or recycled (in order of priority) to the maximum extent practical.

Permit Status

On December 27, 2001, DEQ issued a VWP permit to ECTI authorizing water intake facilities in the James River.[41] In March of 2002, the U.S. Army Corp of Engineers granted authorizations related to construction activities in wetlands. On April 30, 2002, DEQ issued a PSD air permit for the operation of the Bear Garden facility.[42] A permit for the water storage reservoir was issued on May 31, 2002. The VPDES permit was issued on August 6, 2002.[43]

DISCUSSION

Standard of Review

This application was filed prior to January 1, 2002, when the standards applicable to approval were set forth in § 56-265.2 B of the Code of Virginia. Thus, Tenaska II based its case and offered evidence to satisfy the requirements of that Code section.

Section 56-265.2 B of the Code of Virginia provides, in pertinent part, that:

> The Commission…may permit the construction and operation of electrical generating facilities, which shall not be included in the rate base of any regulated utility whose rates are established pursuant to Chapter 10 (§ 56-232 *et seq*.) of this title, upon a finding that such generating facility and associated facilities including transmission lines and equipment (i) will have no material adverse effect upon the rates paid by customers of any regulated public utility in the Commonwealth; (ii) will have no material adverse effect upon reliability of electric service provided by any such regulated public utility; and (iii) are not otherwise contrary to the public interest. In review of its petition for a certificate to construct and operate a generating facility described in this subsection, the Commission shall give consideration to the effect of the facility and associated facilities, including transmission lines and equipment, on the

[41]The VWP permit is attached as Appendix C to this Report.
[42]Ex. 13. The PSD permit is attached as Appendix B to this Report.
[43]Ex. GK-9.

> environment and establish such conditions as may be desirable or necessary to minimize adverse environmental impact as provided in § 56-46.1. Facilities authorized by a certificate issued pursuant to this subsection may be exempted by the Commission from the provisions of Chapter 10 (§ 56-232 *et seq*.) of Title 56.

The Commission, however, has held that the Restructuring Act[44] replaces the requirements for approval contained in §§ 56-234.3 and 56-265.2 on and after January 1, 2002.[45] Furthermore, the Commission stated:

> [Section] 56-580 D is designed to replace § 56-265.2 with respect to generation. Specifically, much of the text of § 56-580 D that authorizes the Commission to permit the construction of generating facilities is drawn virtually verbatim from § 56-265.2 B. The material difference is that § 56-580 D requires only two of the three findings required under § 56-265.2 B, eliminating the requirement that a proposed facility will have no material adverse effect upon the rates paid by customers of any regulated public utility in the Commonwealth.[46]

Moreover, § 56-577 A 3 of the Code of Virginia provides that "[o]n and after January 1, 2002, the generation of electric energy shall no longer be subject to regulation under this title [Title 56], except as specified in this chapter [the Restructuring Act]." Therefore, an exemption from the provisions of Chapter 10 of Title 56 is no longer necessary.

This application must be assessed under the criteria established in 56-580 D as set forth below:

> The Commission shall permit the construction and operation of electrical generating facilities upon a finding that such generating facility and associated facilities: (i) will have no material adverse effect upon reliability of electric service provided by any regulated public utility and (ii) are not otherwise contrary to the public interest…the Commission shall give consideration to the effect of the facility and associated facilities, on the environment and establish such conditions as may be desirable or necessary to minimize adverse environmental impact as provided in § 56-46.1.

[44] Va. Code § 56-576 *et seq*.
[45] *Commonwealth of Virginia at the relation of the State Corporation Commission Ex parte: In the matter of amending filing requirements for applications to construct and operate electric generating facilities*, Case No. PUE010313, Order dated August 3, 2001.
[46] Id. at 4.

Both §§ 56-265.2 B and 56-580 D incorporate and refer to § 56-46.1 of the Code of Virginia which states in part:

> [The Commission] shall give consideration to the effect of that facility on the environment and establish such conditions as may be desirable or necessary to minimize adverse environmental impact. . . [In such proceedings] the Commission shall receive and give consideration to all reports that relate to the proposed facility by state agencies concerned with environmental protection; and if requested by any county or municipality in which the facility is proposed to be built, to local comprehensive plans that have been adopted pursuant to Article 3 (§ 15.2-2223 et seq.) of Chapter 22 of Title 15.2. Additionally, the Commission (i) shall consider the effect of the proposed facility on economic development within the Commonwealth and (ii) shall consider any improvements in service reliability that may result from the construction of such facility.

Effective July 1, 2002, § 56-46.1 A now provides, among other things, that permits regulating environmental impact and mitigation of adverse environmental impact shall be deemed to satisfy the requirements of such section with respect to all matters that are governed by the permit.

Finally, § 56-596 A of the Code of Virginia sets forth additional criteria that the Commission is required to consider in matters relating to the provisions of the Restructuring Act, including the review of petitions for approval to construct and operate electric generating facilities. Specifically, this section states: "In all relevant proceedings pursuant to this Act, the Commission shall take into consideration, among other things, the goals of advancement of competition and economic development in the Commonwealth."

In summation, the Commission set out six general criteria, or areas of analysis, that apply to electric generating plant applications: (1) reliability; (2) competition; (3) rates; (4) environment; (5) economic development; and (6) public interest.[47] These criteria, as they apply in this case, are discussed below.

Water

Water Withdrawal

Data regarding water withdrawal from the James River is found in the draft VWP permit for ECTI.[48] The VWP Permit contains special conditions designed to protect the river and associated wetlands during the construction phase of the project. Water withdrawal conditions are designed to regulate and determine water withdrawal during various levels of flow. The draft permit contains an equation used to determine maximum daily withdrawal. River flows are to be measured at the Scottsville gauge not less than every 24 hours when streamflow is greater that 2,000 cfs and not less

[47] *Tenaska*.
[48] Ex. No. GK-8, Attachment GK-R-5.

than every six hours when stream flow is less than 2,000 cfs. ECTI must install a total flow meter to determine the total amount of water withdrawn from the river and file annual monitoring reports. The annual monitoring report must contain the following information for each day:

- The date;
- The streamflow measurement(s) of the James River at Scottsville in cfs;
- The time(s) of the measurement(s);
- The maximum allowed daily withdrawal as computed by the specified equation; and
- The actual withdrawal expressed in million gallons as read from the total flow meter.[49]

The Department of Health expressed concerns regarding the level of water consumption associated with the proposed facility. The proposed facility will require approximately seven MGD for operation. Because of evaporation during the cooling process, only 1.6 MGD will be returned to the river. Furthermore, ECTI will be withdrawing an equal amount of water from the river for operation of the Tenaska facility in Fluvanna County. Both the Buckingham and Fluvanna facilities have similar water consumption characteristics.

Henrico County and the City of Richmond obtain their water downstream of the proposed facility. Because water withdrawals by ECTI could affect the water supply for Henrico County and the City of Richmond, two "trigger flow points" based on streamflow levels are recommended by DEQ. The first trigger point would require voluntary conservation measures by ECTI and the second trigger point would require mandatory conservation measures. DGIF recommends alternate water storage in the form of a reservoir to be used when water withdrawal from the river is restricted. DGIF also recommends specific water allocations for Tenaska I and Tenaska II which will allow different flowby determinations for each facility. Specific water allocation and a water conservation plan would minimize the cumulative impacts of multiple projects on this area of the river.

On December 27, 2001, (later modified on February 8, 2002) DEQ issued a VWP permit to ECTI authorizing it to construct water intake facilities and withdraw water from the James River to serve the proposed facility.[50] In May of 2002, public review for a permit for the water storage reservoir was completed and the permit was issued on May 31, 2002.

Water Discharge

The DCR and DGIF raised concerns through the DEQ-coordinated environmental review process regarding the proposed facility's discharge of thermal effluent into the James River. The discharge point for the proposed facility is approximately 1,000 feet downstream on the south side of the James River from the Bremo Power Station. The Bremo Power Station is located and discharges thermal effluent on the north side of the river. Derral Jones, planning bureau manager in the Planning and Recreation Resources Division of DCR, stated in his memorandum of

[49]Ex. GK-8, Ex. GK-R-5, at 4.
[50]The VWP permit is attached as Appendix C to this Report.

November 1, 2001,[51] that the Bremo Power Station currently has a serious negative impact on the James River caused by the discharge of thermal effluent (hot water) into an aquatic environment already stressed by low flows and high water temperatures.[52] Mr. Jones stated that, for approximately one mile downstream from the Bremo Power Station discharge point, the river is devoid of vegetation and recreational species of fish are not found in this area. Mr. Jones described this area as a "dead zone."[53]

Mr. Jones explained that, in his opinion, adding the thermal discharge from the Tenaska II facility across the river from the Bremo Power Station will further degrade the James River because the thermal discharge will further increase the river's water temperature. In addition, the removal of millions of gallons of water from the river will decrease the flow of the river into which the hot water is discharged, thereby making it more difficult for the hot water to be cooled. Mr. Jones further stated that the discharge contains a "soup" of concentrated materials left after most of the water has been boiled away in plant operation. This soup of concentrated materials, when added to that of the Bremo Power Station, will further degrade water quality downstream from the two power plants. During periods of high water flow, Mr. Jones testified that these impacts will be minimal. However, during low flow periods, these impacts will affect aquatic species. Mr. Jones recommended consideration of an alternative to discharging into the James River during periods of low flow.[54]

On cross-examination, Mr. Jones acknowledged that he is not a scientist and that DCR would have to defer to the water sections of the DGIF and DEQ to determine the measurable impact of the Tenaska II discharge on aquatic life in the James River.[55]

DEQ's Valley Regional Office provided preliminary information concerning water temperatures in the James River below the Bremo Power Station. The following observations were derived from surveys conducted over the last ten years:

1. Elevated temperatures below the discharge point typically stay along the north bank of the river (the same side as the discharge point), with no elevated temperatures observed between the middle of the river and the south bank;

2. Temperatures are highest just below the discharge point, typically ranging from 5.4° to 18° Fahrenheit higher than ambient water temperatures; and

3. Temperatures do not typically return to ambient levels for approximately six miles downstream of the discharge. At times, water temperatures

[51]Ex. DJ-7
[52]Temperatures of 95° Fahrenheit have been reported at monitoring points downstream of the Bremo Power Station discharge point. The normal summer temperature of the river is approximately 80° Fahrenheit. (Ex. MAT-6, Appendix A at 5).
[53]Id.
[54]Id.
[55]Tr. 55.

remain as high as 2° Celsius above ambient levels at the final testing station eight miles downstream from the discharge point.[56]

Mr. Paylor of DEQ testified he was unaware that the James River is currently in a stressed situation and he had no information regarding a "dead zone" in the river.[57] Further, Mr. Paylor pointed out that the Bremo Power Station has been in compliance with its permit requirements since 1976. Mr. Paylor explained that DEQ conducts an annual mixing zone study involving detailed temperature profiles to assure that permit requirements are met. In considering Tenaska II's water discharge permit, Mr. Paylor stated that the entire affected river area including the present mixing zone would be reviewed.[58] Mr. Paylor also testified that DEQ does not have a recommendation at present on routing the effluent to a reservoir, but that input from DGIF and DCR would be considered in making that determination.[59]

Tenaska II pointed out in its brief that there is a significant difference between the once-through cooling system utilized by the Bremo Power Station and the re-circulating cooling system to be used by the Bear Garden facility. The once-through cooling system used by the Bremo Power Station draws large volumes of water from the river to cool the condenser. Once the heat transfer is made, the hot effluent is discharged directly into the James River where it creates a thermal mixing zone until it is cooled by the river to the ambient water temperature.[60]

In contrast, the Tenaska II facility has a large cooling tower that cools the water circulated through the condenser by dissipating the heat into the atmosphere instead of the river. Dr. Kunkel describes the cooling tower as a big box with large fans at the top that draw air up through the tower as water is sprinkled down through a matrix that maximizes contact with the air. This contact with the air cools the water as it falls to the basin of the cooling tower. The cooling tower process allows the plant to recycle water through the system ten to fifteen times, depending on the quality of the water.[61] In short, the Bremo Power Station cools its water by discharging it directly into the river and the Bear Garden facility would cool its water by discharging most of the heat into the air.

Further, the Applicant pointed out that re-circulating cooling tower technology has been identified by the EPA as a component of the best available technology for power plant cooling. Also, the Bear Garden facility is expected to discharge approximately 0.523 MGD of effluent as opposed to the approximately 163.6 MGD of effluent discharged by the Bremo Power Station.[62]

Dr. Kunkel provided a chart depicting an impact analysis based on a computer model (Cormix[63]) that provides information regarding ambient water temperature for a 12-month period.[64]

---

[56]Ex. MAT-6, Appendix A, at 6.
[57]Tr. 61.
[58]Tr. 63, 64, 66.
[59]Tr. 68.
[60]Brief at 4, 5.
[61]Tr. 80, 81.
[62]Company Brief of January 31, 2002, at 6.
[63]The CORMIX model is a hydrodynamic mixing zone model developed by Cornell University under an agreement with the EPA, and is relied on by most regulatory agencies.
[64]Ex. GK-8, Attachment GK-R-2, Tab 5; VPDES Permit Application, Tab 5, Figure 1.

The resulting temperature increase in the James River from effluent discharge of the Bear Garden facility would be less than one degree centigrade in any given month.

Virginia has set the following parameters in regard to water discharge:[65]

- The discharge must not cause the temperature of the river to exceed 32° Celsius (9 VAC 25-260-50);
- The discharge must not cause a rise above natural temperature in excess of 3° Celsius (9 VAC 25-260-60);
- The discharge must not cause a maximum hourly temperature change in excess of 2° Celsius (9 VAC 25-260-60).[66]

According to the CORMIX data, the discharge from the Bear Garden facility would fall within the parameters set forth in the regulations. Further, the results of this study indicate minimal impact on water temperatures in the James River caused by discharge from the Bear Garden facility.[67] In that regard, there is insufficient evidence to support the proposal by DCR and DGIF that the effluent be routed to a storage reservoir during periods of high stress.[68] Dr. Kunkel testified that this alternative would be unreasonable because, as the water is evaporated during recycling, minerals become concentrated to the point that the water is unsuitable for further plant use.[69]

A comparison of the thermal discharge from the Bremo Power Station and the Bear Garden facility is set forth below:

	Amount of Effluent Discharge	**Difference between discharge temperature and river temperature**
Bremo Power Station	163.6 MGD	20.7° F
Bear Garden facility	0.523 MGD	8.9° F (11.9° F max)

Obviously, the impact of the Bear Garden facility discharge would be far less than the impact of the Bremo Power Station discharge on the river. Further, the best technology available for minimizing thermal effects of power facilities is the cooling tower technology proposed by Tenaska II. Thermal discharge is regulated by DEQ through its VPDES review. On August 6, 2000, DEQ issued a VPDES permit for the Bear Garden facility authorizing the discharge of effluent into the James River subject to permit limitations and requirements.[70]

[65]Ex. GK-8, Attachment GK-R-2, Tab 5.
[66]Ex. GK-8, Attachment GK-R-2, Tab 5 at 3 of 4 and Figure 1.
[67]The average flow of the James River is 5,000 cubic feet per second. The effluent discharge of the Bear Garden facility would be approximately 1 cubic foot per second. (Tr. 96, 97).
[68]Commission Staff points out in its brief that, based on the evidence, any restrictions on the proposed facility's water discharge would more properly addressed in the VDPES permitting process. (Brief at 5).
[69]Tr. 85; Ex. GK-8, at 8.
[70]The VPDES permit is Ex. GK-9.

Air Quality Impacts

The Bear Garden facility will require air permits for construction and operation of the power plant and will be subject to NSPS[71] as well as requirements applicable to major sources located in PSD[72] areas. Any builder of a proposed power plant is required, under the federal Clean Air Act and by DEQ to conduct air quality analyses. DEQ and the EPA use these analyses to assess the impact of emissions from a new power plant on air quality. Tenaska II states that the results of the analyses contained in the PSD permit application demonstrate that, even assuming the proposed facility will emit at the maximum potential emissions rate, air quality impacts from the facility will be well below all applicable federal and state health- based standards.[73] Additional air quality analyses contained in the PSD permit application demonstrate the proposed facility will not adversely impact any air quality related values ("AQRVs") in nearby national parks and wilderness areas.[74]

Buckingham County is designated as either "attainment" or "unclassifiable" for all NAAQS, therefore PSD applicability must be evaluated for all criteria pollutants.[75] The proposed facility will have the potential to emit greater than 100 tons per year of NO_x, CO, PM_{10}, and VOCs. Therefore, the proposed facility will be classified as a major stationary source, and emissions of all regulated pollutants at the facility must be compared to the PSD significant emission rate thresholds. The potential emission rates for each PSD pollutant and PSD significant emission rates are set forth below.[76]

Pollutant	Emission Rate (tpy)	PSD Significant Emission Rate (tpy)	Subject to PSD review?
NO_x	580	40	Yes
CO	1,432	100	Yes
SO_2	72	40	Yes
Sulfuric acid mist	26	7	Yes
PM_{10}	229	15	Yes
VOC	294	40	Yes

The combustion turbines and HSRG duct burners will be subject to the Acid Rain Program ("ARP") which requires emission monitoring for multiple pollutants and emissions credits. Tenaska II will submit an ARP permit application. Depending on the concentration and quantity of anhydrous ammonia held in storage for the SCR system, a Risk Management Program may be applicable. The proposed facility will also be subject to the Title V Federal Operating Permits Program because potential emissions of regulated pollutants are greater than 100 tons per year. Tenaska II will have one year from the start of operation to submit a Title V permit application.

[71] Regulations for the Control and Abatement of Air Pollution (9 VAC 5-50-400).
[72] 9 VAC 5-80-1700.
[73] Ex. GK-3, Environmental Assessment at 9.
[74] These AQRVs include visibility, regional haze, and the deposition of nitrates and sulfates in soil and surface waters. (Id. at 9, 10).
[75] 40 C.F.R. § 81.347.
[76] Ex. GK-3, Environmental Assessment at Attachment 6 Table 1-2.

NSPS require new, modified, or reconstructed sources to control emissions to the levels equivalent to the Best Available Control Technology ("BACT") for that pollutant. For the combustion turbines and HRSG duct burners BACT for NO_x is determined to be SCR in concert with water injection. When firing distillate in the combustion turbines, the BACT is dry low-NO_x combusters on the combustion turbines and low-NO_x duct burners.

Emissions from the cooling tower may include PM_{10} because the water circulating in the tower contains small amounts of dissolved solids (e.g., calcium, magnesium) that are assumed to crystallize and form airborne particles as the water leaves the cooling tower. Tenaska II proposes to reduce particulate emissions from the cooling tower by installing drift eliminators. The drift eliminators should produce a PM_{10} BACT limit of 0.13 pounds per million gallons.[77]

Cumulative Air Quality Analysis

Existing Air Quality

On January 16, 2002, the Commission issued an order in *Tenaska* remanding the case for additional evidence regarding existing air quality and cumulative impact analysis of all power plants proposed to be built in Virginia. On February 4, 2002, representatives from DEQ, Trinity Consultants, Commission Staff, and the Applicant met to agree on a methodology for the modeling and assessment of cumulative air quality impacts. Based on the models agreed upon, the Company determined the existing air quality in Buckingham County and the cumulative impact of 23 proposed power plants in Virginia.[78] Because the site locations for the proposed Tenaska facilities in Buckingham and Fluvanna Counties are less than 13 kilometers apart, the same analysis performed by Trinity Consultants was used for both proceedings.

The DEQ maintains 13 monitoring stations for NO_x; 24 stations for O_3; 19 stations for PM; 11 stations for SO_2; and 12 stations for CO that recorded measurements between 1996 and 2000. The results of the air analysis for each pollutant are based on the highest level of each pollutant recorded at representative monitoring stations during the five-year period between 1996 and 2000. Two criteria were used to determine which monitoring stations were representative of the proposed facility: (a) whether the station was in a rural or urban area, and (b) the distance between the monitoring station and the Bear Garden facility. For all pollutants except CO, the rural monitoring stations closest to the Bear Garden site were used as representative stations. None of the monitoring stations for CO during the 1996 to 2000 time period were rural; therefore, the closest urban monitoring station, Richmond, was used for CO.[79]

[77] Ex. GK-3, Environmental Assessment, at 7-20.

[78] Tenaska II based its analysis on the 23 proposed electric generation facilities, including the Bear Garden facility, for which an air permit application was submitted prior to April 10, 2002.

[79] Since CO is primarily emitted by cars and trucks, use of the Richmond metropolitan area station would result in a very conservative comparison for Buckingham County. That is, the CO readings for Richmond would be expected to be much higher than the CO levels in Buckingham County.

Based on data from 1996 through 2000 from representative monitoring stations, the maximum monitored ambient concentrations are set forth in the table below.[80]

Worst-Case Background Air Quality for Buckingham County and the nearby counties

Pollutant	Averaging Period	NAAQS	Maximum Monitored Concentration	Year	VA County	Monitor Identification Number
PM_{10}	Annual	50 $\mu g/m^3$	32 $\mu g/m^3$	1997	Rockingham	51-165-0002
	24-hour	150 $\mu g/m^3$	86 $\mu g/m^3$	1997	Culpeper	51-047-0002
SO_2	Annual	80 $\mu g/m^3$	13 $\mu g/m^3$	1997	Rockingham	51-036-0002
	24-hour	365 $\mu g/m^3$	40 $\mu g/m^3$	2000	Rockingham	51-036-0002
	3-hour	1,300 $\mu g/m^3$	69 $\mu g/m^3$	1997	Rockingham	51-036-0002
NO_2	Annual	100 $\mu g/m^3$	21 $\mu g/m^3$	2000	Caroline	51-036-0002
Ozone†	1-hour	125 ppb	117 ppb	1997-99	Caroline	51-033-0001
CO	8-hour	10,000 $\mu g/m^3$	5,600 $\mu g/m^3$	1997	Richmond (City)	51-760-0021
	1-hour	40,000 $\mu g/m^3$	8,200 $\mu g/m^3$	1997	Richmond (City)	51-760-0021

* No processed 8-hour ozone monitoring data are available.

† The current NAAQS for ozone is a 1-hour standard. The 1-hour standard is 0.12 ppm (235 $\mu g/m^3$). For an area to be in compliance with the NAAQS, no monitor can measure a concentration of 125 ppb or higher more than three times in any three consecutive years. The worst-case background concentration at each monitoring station is determined by selecting the fourth highest measured 1-hour concentration during any consecutive three-year period. This is the 1-hour concentration that must be less than 125 ppb for an area to be in compliance. Therefore, it is to this concentration that the combined impact from the 23 proposed plants is added to determine cumulative impact. The reason that several measured exceedences of the standards are allowed without violating the NAAQS is due to the fundamental nature of ozone. Meteorological conditions have a great influence on the formation of ozone and certain rare weather occurrences can artificially create high ozone readings. Although these conditions are rare, an area with good air quality may still exceed the 1-hour standard under these rare conditions without violating the NAAQS. None of the representative ozone monitoring stations for Buckingham County are in violation of the 1-hour NAAQS.

As shown by this table, the existing air quality in the Buckingham County area is better than the NAAQS for all pollutants.

Cumulative Air Analysis

To address the cumulative impact of all proposed facilities, Trinity developed information on all recently permitted and proposed electric generating units in Virginia. Trinity modeled the maximum potential emission rates from each main generating unit proposed for Virginia. Auxiliary units were not included because, with their relatively short stack heights and smaller exhaust gas velocities, their emissions are very localized. Typically, the main generating units are responsible for well over 90 percent of facility emissions. Worst case emission rates for the electric generating units at each of the 23 proposed plants were identified from permit applications.[81] DEQ approved the air dispersion models and EPA guidelines were followed in selecting meteorological data.

The results of the cumulative impact assessment show that the maximum combined impacts on air quality in Buckingham County from all 23 proposed plants are below the single source

[80] Ex. 12, Table 2-6.

[81] The majority of air permits issued by DEQ have emission limits that are significantly less than the levels requested in the permit applications. (Ex. 11, at 16).

modeling significance levels for all pollutants.[82] The cumulative impact of all 23 proposed power plants, including the Bear Garden facility is set forth below:

Cumulative Impact Assessment Summary for Buckingham County

Pollutant Name	Averaging Period	Year of Max.	VA County	Maximum Background Concentration (ug/m^3)	Maximum Modeled Concentration (ug/m^3)		Total Predicted Concentration (ug/m^3)	NAAQS (ug/m^3)
					All 23 Plants*	Tenaska Bear Garden		
NO_2	Annual	89	Buckingham	21	0.40	0.16	21.40	100
PM_{10}	Annual	89	Buckingham	32	0.17	0.06	32.17	50
PM_{10}	24-hour	90	Buckingham	86	1.86	1.56	87.86	150
SO_2	Annual	89	Buckingham	13	0.06	0.02	13.06	80
SO_2	24-hour	92	Buckingham	40	2.61	0.22	42.61	365
SO_2	3-hour	92	Buckingham	69	10.61	2.73	79.61	1,300
CO	8-hour	90	Buckingham	5,600	20.66	19.07	5,620.66	10,000
CO	1-hour	91	Buckingham	8,200	51.59	12.91	8,251.59	40,000

*The maximum modeled concentrations shown for all 23 plants includes the contributions of the Tenaska Bear Garden Generating Station.

An analysis of ozone impacts requires the use of a complex multi-source dispersion model. Ozone modeling also requires a baseline inventory of actual emissions from all sources of NO_x and VOC, in Virginia. Because DEQ has access to a multi-source ozone model and a detailed state-wide emissions inventory, Trinity relied on DEQ's January 30, 2002, modeling as a basis for assessing cumulative ozone impact. DEQ performed a cumulative ozone analysis to assess the cumulative impact of 16 proposed power plants. Unlike other criteria pollutants released directly from emission sources, ozone is formed in the atmosphere through complex reactions among ozone precursors, primarily NO_2 and VOCs. The total maximum potential NO_x emissions from 16 proposed power plants is 5,986 tons per year. Using the DEQ analysis as a base, Trinity calculated a total maximum potential for NO_x emissions from all 23 proposed power plants of 8,931 tons per year.[83]

Translated into ozone, DEQ's cumulative results predict maximum ozone concentration attributable to the 16 proposed power plants analyzed as between 2.0 and 2.5 ppb in Buckingham County and the surrounding area. Trinity scaled DEQ's results to 23 proposed power plants and arrived at a concentration of less than 4 ppb. This result represents no more than five percent of the NAAQS levels established by the EPA. The following table represents the ozone analyses:

Ozone Incremental Impact Comparison to the NAAQS

Averaging Period	Maximum Modeled O_3 Concentration (ppb)		Background Concentration (ppb)	Total Predicted Concentration (ppb)	NAAQS* (ppb)
	Attributable to 16 Proposed Plants	Scaled for 23 Proposed Plants			
1-hour	2.5	4.0	117	121	125

*Although the 1-hour NAAQS for ozone is 0.12 ppm, only monitored concentrations greater than 125 ppb are considered exceedences of the standard.

[82]The results of the cumulative impact analysis are provided in Tables 3-8 and 3-9 of the Trinity analysis. (Ex. 12). *See also* the bar graphs in Appendix D of this Report.
[83]Ex. 12, at 4-1.

As depicted in the table above, the existing or background ozone concentrations are high.[84] This situation is common throughout the eastern United States and is attributable in part to the regional transport of ozone and its precursors.

In making an analysis of the cumulative air emission impact, several factors need to be considered. First, the analyses are very conservative. For instance, in establishing a background air analysis, the highest monitored pollutant concentrations recorded during a five-year period were used. Second, emissions were modeled at the maximum levels requested in the permit applications or the maximum levels authorized by the DEQ.[85] The model assumed all 23 facilities were operating at the maximum rate approved or requested by permit application. The majority of air permits issued by the DEQ have emission limits that are significantly less than the levels requested in the permit applications.[86] Third, it is highly unlikely that all of the proposed power plants will be constructed. With current economic conditions and the state of the independent power producing industry, many applicants have delayed or abandoned plans to develop proposed power plants. Fourth, the model overstated impacts from units more than 50 kilometers away. The range of pollution from the proposed gas-fired power plants is small. As discussed in Case No. PUE-2001-00423,[87] the vast majority of the pollutant impact occurs within a few miles of the plant.[88] Therefore, the probability of overlapping pollution impacts from the proposed power plants is small. Finally, the models do not account for the NO_x SIP-Call,[89] the Acid Rain Prevention Program, the Regional Haze Program, or any of the other regulatory programs currently in place to reduce pollution.

On April 30, 2002, Tenaska II received the PSD permit to construct and operate the Bear Garden facility.[90] The PSD permit contains operating emission limitations for each criteria pollutant.[91]

Wetlands and Endangered Species

The Department of Agriculture and Consumer Services and DCR found that the project would not affect state-listed endangered or threatened plant or insect species. The DEQ report states that the Special Conditions in the VWP permit will ensure no net loss of wetland acreage.

---

[84]The ozone bar graph is found in Appendix D to this Report.
[85]Ex. 11, at 12.
[86]Id.
[87]*Application of Kinder Morgan Virginia LLC, For approval of a certificate of public convenience and necessity pursuant to Va. Case §56-265.2, an exemption from Chapter 10 of Title 56, and interim approval to make financial commitments and undertake preliminary construction work,* Case No. PUE-2001-00423, Report on Remand (August 13, 2002).
[88]Report at 5.
[89]Under the NO_x SIP Call, the EPA has established a summer cap on NO_x emissions from electric generating units and large industrial boilers at levels much lower than current emissions. Compliance is required by May of 2004. Based on EPA estimates, the NO_x SIP Call will reduce NO_x emissions by over 100,000 tons per year from all Virginia sources and by over 1,000,000 tons per year over the 22 eastern states and the District of Columbia. (Ex. 11, at 18). *See* Composite Decrease in Ground Level Ozone Concentrations Attributable to the NO_x SIP Call –Appendix D to this Report.
[90]Ex. 13.
[91]The PSD permit is attached to this Report as Appendix B.

The environmental impact of the 14-mile natural gas lateral pipeline is subject to federal review and is addressed below. The U.S. Army Corp of Engineers granted authorization for construction activities in wetlands and other waters (pertaining to the proposed facility's water supply arrangements) in March of 2002.

Lateral Gas Pipeline

The Bear Garden facility will primarily use natural gas to generate electricity. A Transcontinental Gas Pipe Line Corporation ("Transco") interstate natural gas pipeline is located approximately 14 miles from the proposed Bear Garden facility. Therefore, a new lateral pipeline must be constructed to connect the Transco pipeline with the proposed facility. This lateral pipeline will be constructed and owned by Transco. It will run from the interstate pipeline to a metering site located on the Bear Garden facility property. Tenaska II will be responsible for the piping from the metering site to the generating units. Because the lateral pipeline will be an integral part of an interstate pipeline, the Federal Energy Regulatory Commission ("FERC") has exclusive jurisdiction over the permitting, construction, and operation of the lateral pipeline.[92]

The Applicant has entered into an agreement with Transco for construction of the gas pipeline. According to the agreement, Transco is responsible for the route, environmental permitting and construction of the lateral pipeline between the main pipeline and the metering site at the Bear Garden facility. The environmental review conducted by federal agencies is extensive. Dr. Kunkel has reviewed available environmental data and acknowledges that any route would involve stream crossings and potential wetland impacts. However, Dr. Kunkel testified that the existing information concerning wetlands, cultural resources, and endangered species indicates that these concerns should not be significant.[93]

Effect on Rates and System Reliability

At the request of Tenaska II, Dominion Virginia Power performed a Generation Interconnection Evaluation Study (the "GIES Study") to determine if the power produced by the Bear Garden facility could be accommodated on its transmission system beginning in the summer of 2004. The GIES Study is necessary to evaluate how the additional generation would impact the existing transmission system. Preliminary stability studies were also performed as a part of the overall GIES Study. Dominion Virginia Power points out that, because there was no request for transmission service, the new generation was modeled to serve native load and not for off-system sales outside normal operating conditions.[94]

Dominion Virginia Power evaluated two potential interconnection sites: the Bremo Power Station and a site five miles away from the Bremo Power Station on the 230 kV Bremo-Farmville transmission line. Tenaska II is working with Dominion Virginia Power to determine the most appropriate means of connecting the Bear Garden facility to the transmission grid. Based on

[92]Ex. GK-3, Environmental Assessment at 3.
[93]Ex. 11, at 23.
[94]Ex. 10, at 4.

preliminary stability studies and power flow studies, Dominion Virginia Power determined that transmission system improvements would be required to accommodate the Bear Garden facility generation. Some operating restrictions may also be imposed depending on evaluation of facility data not yet received by Dominion Virginia Power. At the time of the transmission interconnection report, Dominion Virginia Power had not received data pertaining to clarification of turbine-governor model/data for the gas units and model/data for the steam unit turbine/governor.

On February 2, 2002, Dominion Virginia Power provided Tenaska II with a Facilities Study identifying the interconnection facilities and system upgrades needed to interconnect the Bear Garden facility to the transmission grid. In light of recent withdrawals of several interconnection service requests, Dominion Virginia Power is currently in the process of revising its studies. The revised interconnection study will not be completed until the summer of 2002 at the earliest.[95] Pursuant to FERC policy, the system upgrades will be fully funded by Tenaska II. Once the Bear Garden facility is operational, Tenaska II will be reimbursed for its expenditures in the form of transmission service credits. Accordingly, there should be negligible, if any impact on Dominion Virginia Power's retail rates. There should be no adverse effect on transmission system reliability because Tenaska II will be responsible for operating the Bear Garden facility in a manner consistent with good utility practices.[96] Finally, since no regulated utility in Virginia will have any financial or ownership interest in the proposed facility, the costs of the facility will not be included in the rate base of any regulated utility.

Impact on Competition

The proposed facility will be qualified as an exempt wholesale generator and will sell power on a merchant basis exclusively at wholesale by means of a tolling agreement. The Bear Garden facility will, upon completion, add 900 MW of generating capacity to the Dominion Virginia Power service territory. Staff witness Carsley testified that the fact that the incumbent utility will not own this generation should theoretically enhance competition. Generally speaking, when capacity not owned by the incumbent utility is located within the incumbent's service territory, this is considered a positive development in terms of market power. Therefore, I find that the addition of a competitive source of electricity available within Virginia is, in theory, a positive development for the advancement of competition in the Commonwealth.

The actual effect on market power in Virginia cannot be determined at this time, however, because the power marketing entity is unknown. Under the provisions of a tolling agreement, the power marketer typically provides the fuel and has control over the power produced at the generation facility. If the unspecified power marketer were to gain control of a significant amount of power produced in an area, the balance of market power would become a concern. Similarly, if the incumbent utility purchased the output of the proposed facility, there would potentially be a negative impact on market power. The Commission cannot determine the true effect of the proposed facility on competition in Virginia without knowledge of the tolling agreement partner and its corporate affiliations. Accordingly, I find that Tenaska II should report to the Commission the

[95] Ex. 10, at 4.
[96] Id. at 5.

name and corporate affiliation of any company entering into a tolling agreement or contract to purchase power generated at the Bear Garden facility.

Traffic

Dr. Kunkel states that Tenaska II will obtain the necessary permits from the Virginia Department of Transportation ("VDOT") to facilitate property access before construction starts. The Buckingham County Board of Supervisors has required Tenaska II to submit a construction traffic management plan that will be reviewed by VDOT. Tenaska II will make any required improvements to the property necessary for access during the construction phase. Once normal operations start, there should be minimal impact on traffic because the facility will have only 25 to 30 permanent employees.

Tenaska II proposes to operate with fuel oil for a maximum of 720 hours annually. Tenaska II plans to have on-site storage capacity of fuel oil for approximately 104 hours of operation at full dispatch. Dr. Kunkel explains that there will be extremely rare occasions when the facility will burn more fuel oil than is stored on-site. During these periods, there will be increased truck traffic to the facility. However, Dr. Kunkel states that VDOT traffic volume estimates for the roadways to the proposed facility indicate that the roads can accommodate the increased truck traffic.[97]

Residential Impact

The proposed Bear Garden facility will be located in the center of a 672-acre tract of land commonly referred to as the Buschmann property. Adjoining the Buschmann property on the south and east is a 440-acre tract of land owned by Westvaco. The closest residence to the facility is the Buschmann residence, which is located in excess of 1500 feet from the corner of the 50-acre generation facility site. The Buschmann family sold Tenaska II the generation facility site; therefore, their acceptance of the proposed facility is implied. The next closest facility is the Third Liberty Baptist Church located on State Route 670. Tenaska II has had discussions with the congregation concerning the proposed facility.[98] No public witnesses appeared at the hearing and no written comments were filed with the Commission opposing the proposed facility. Accordingly, I find the proposed Bear Garden generation facility appears to be well situated to avoid any residential impact.

Public Interest and Economic Development

Rebecca Carter, county administrator for Buckingham County, testified that the citizens of Buckingham County have overwhelmingly accepted and welcomed this power plant in their County.[99] The proposed facility site on the Buschmann property is well suited for a power plant; it is remote, yet close enough to gas and electric transmission lines to be readily served by both.

[97]Ex. GK-8, at 7 and attached GK-R-4.
[98]Tr. 37, 38.
[99]Tr. 10.

Buckingham County is rural and the proposed facility would be an important addition to the County's tax base. In addition to the construction jobs created during the initial phase, the proposed facility will bring 25 to 30 well paying permanent jobs to the local economy.[100] It is important to note that neither Buckingham County nor the Commonwealth is expected to incur any costs associated with infrastructure improvements or through financial or other concessions. The availability of electric generation resources should have a positive impact on economic development in that it could influence other businesses or manufacturing companies to locate in Buckingham County. Accordingly, I find that the proposed Bear Garden facility is in the public interest and is a positive factor for economic development.

FINDINGS AND RECOMMENDATIONS

Based on the evidence in this case, I find that:

1. The proposed facility will have no material adverse effect upon the rates paid by customers of any regulated utility in the Commonwealth;

2. The proposed facility will have no adverse effect upon the reliability of electric service provided by any regulated public utility;

3. The current level of air quality in Buckingham County is good, and is in attainment of all National Ambient Air Quality Standards;

4. The cumulative impact air analysis is reasonable;

5. The cumulative impact air analysis adequately demonstrates that the emissions, when combined with the emissions from other existing or proposed facilities, will have no material adverse effect on air quality in Buckingham County and the surrounding area;

6. The proposed facility will not adversely impact any private residences;

7. The proposed facility is not contrary to the public interest;

8. The proposed facility should enhance competition at the wholesale level;

9. Tenaska II should be directed to file with the Commission any tolling agreements pertaining to the proposed facility;

10. The evidence supports a finding that the proposed facility will provide a positive economic benefit to Buckingham County and the Commonwealth;

[100] Although Staff witness Carsley is correct in pointing out that the Applicant did not provide an analysis of economic benefits based on a standard economic methodology, the economic benefits arising from jobs and an increased tax base are undeniable.

11. The Commission should grant Tenaska II a certificate of public convenience and necessity to construct and operate the proposed facility conditioned upon receipt of all permits required to construct and operate the proposed facility;

12. The certificate of convenience and necessity issued to Tenaska II should contain a provision that it will expire two years from the date issued, if construction on the proposed facility has not commenced;

13. Tenaska II should be directed to report to the Commission any changes in its business plan; and

14. The Stipulation between Staff, Tenaska II, and Columbia Gas should be approved.

I therefore **RECOMMEND** the Commission enter an order that:

1. ***ADOPTS*** the findings contained in this Report;

2. ***GRANTS*** Tenaska II a certificate of public convenience and necessity pursuant to § 56-580 D of the Code of Virginia to construct and operate an electric generation facility in Buckingham County, Virginia;

3. ***PROVIDES*** that the certificate will expire if construction has not begun within two years from the date of a Commission final order granting approval of the proposed facility;

4. ***PROVIDES*** that the certificate is conditioned on the receipt of all permits necessary to operate the proposed facility and directs Tenaska II to provide to the Commission's Division of Energy Regulation a complete list of permits granted; and

5. ***DISMISSES*** this case from its docket of active matters.

COMMENTS

The parties are advised that any comments (Section 12.1-31 of the Code of Virginia and 5 VAC 5-20-120 C) to this Report must be filed with the Clerk of the Commission in writing, in an original and fifteen (15) copies, within twenty-one (21) days from the date hereof. The mailing address to which any such filing must be sent is Document Control Center, P.O. Box 2118, Richmond, Virginia 23218. Any party filing such comments shall attach a certificate to the foot of

such document certifying that copies have been mailed or delivered to all counsel of record and any such party not represented by counsel.

Respectfully submitted,

_____

Howard P. Anderson, Jr.
Hearing Examiner